
Space Weather Forecast

Issued on Monday, 02 May 2022 at 01:15 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Brief lull in risk of R1/R2 radio blackouts, however activity on both eastern and western solar horizons.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity fell to low over the past 24 hours, with occasional common-class X-ray flare activity observed. The largest flare of the period occurred at 01/1128UTC, emanating from the vicinity of returning sunspot region over the sun's southeastern horizon, and perhaps provides a hint of an upturn in activity into the coming working week. This is after the current brief lull, with the passing of many of the very active northwestern horizon groups.

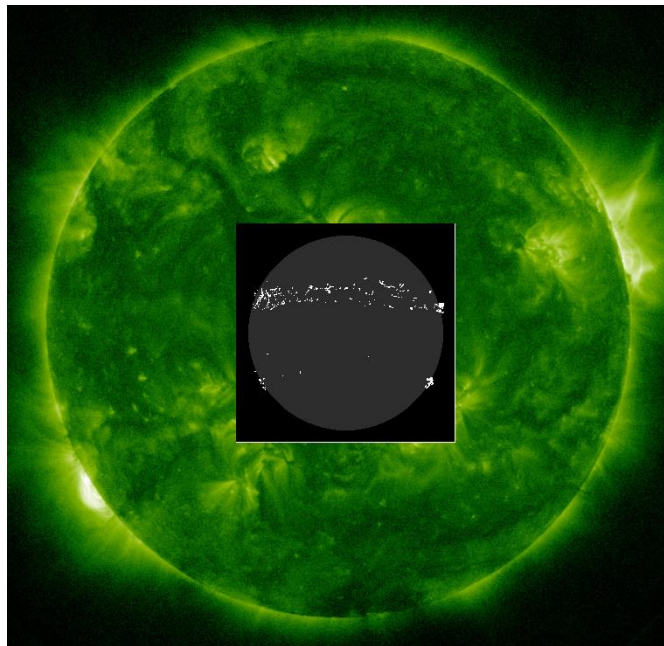


Figure 1: 01/2300UTC false-colour extreme UV image showing bright flux regions departing the northwest as a new area arrives in the southeast. Shown inset is the positions of all X-ray flare activity above common-class in the past fortnight, showing the large contribution made by the departing regions now upper right on the sun's western horizon. Inset courtesy of SIDC ROB.

There were just two surviving front-sided sunspot regions by the end of the UTC day of Sunday 01 May, with both magnetically unipolar, stable and unremarkable. A third small group faded away in the northwestern quarter of the sun in the same period.

Satellite imagery for the period was dominated by emissions from the horizons of the sun (from an Earth perspective), mainly in the vicinity of the aforementioned recently passed northwestern

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groups, with up to seven separate events visible. At the time of writing none are thought to be Earth-directed, with many firing along similar trajectories to most likely merge. Should thoughts on this change, updates will follow in forthcoming guidance.

Solar Wind / Geomagnetic Activity: The solar wind remains characteristic of a fast wind, with this thought to be tied to a 'coronal hole' in the southwest of the sun. There are now some signs that this feature is starting to wane, with the speed falling slightly from elevated to slightly elevated levels, although a weak resurgence was seen later in the UTC day to regain lost ground. Both the number of particles in the solar wind and their associated magnetic field were both unremarkable.

The net result of the above solar wind measures was mainly quiet geomagnetic activity, staying well below Minor Storm G1 throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed, with the trace of high energy protons only very slightly elevated above background, having declined steadily in the wake of the moderate-class flare on 29 April.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity should undergo a decline in the immediate term, with the passing of successive active northwestern horizon sunspot groups, however there is a chance of some recovery as a further active region likely rotates onto the southeast into the new week.

Solar Wind / Geomagnetic Activity: The current fast wind is the only such feature in the period, and should wane through day one, Monday 02 May. No Coronal Mass Ejections (CMEs) now feature in the forecast.

Geomagnetic activity should generally decline from current modest levels: staying below Minor Storm throughout and becoming quiet by midweek.

Energetic Particles / Solar Radiation: Solar radiation storms carry a slightly raised chance of passing S1 at first, due to the presence of numerous active regions narrowly over the western solar horizon, however this risk should reduce to background by midweek.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

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X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	5	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	2	2	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)